

AMENDMENTS TO THE CLAIMS:

The listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS:

1-2. (Cancelled)

3. (Currently Amended) ~~The method of claim 1~~ A method of detecting memory leaks for a program executing on a computer, said method comprising the step of determining when a peak allocated memory level has increased a determined number of times wherein said determined number of times defines an alarm limit, said determining step including the substeps of:

sampling allocated memory levels for the program for which a memory leak has not been detected;

identifying increases in the peaks of the sampled allocated memory levels that are countable towards the alarm limit based on whether the ~~further comprising the step of filtering out~~ increases in peak allocated memory levels ~~not are~~ are ~~indicative of a memory leak associated with said program;~~

detecting a memory leak when countable increases in peak allocated memory levels reach the alarm limit.

4. (Currently Amended) The method of claim 3 ~~wherein said filtering step includes the substeps of~~ further including the steps of:

defining a startup time interval that begins with the initial execution of the program on the computer and which has a determined duration;

ignoring increases in peak allocated memory levels that occur during [[a]] the startup time interval immediately after said program begins to execute such that any increases in peak allocated memory levels that occur during the startup time interval are not countable towards the alarm limit.

5. (Currently Amended) The method of claim 3 ~~wherein said filtering step includes the substep~~ further including the steps of:

establishing a determined time corresponding to a minimum time between a first increase and a second, subsequent increase in peak allocated memory levels in order for the second increase in peak allocated memory level to count towards the alarm limit;

ignoring as not countable toward the alarm limit the second increase[[s]] in peak allocated memory levels that when the second increase occurs less than the determined a preselected time apart after the first increase, which may be indicative of normal memory allocation activity.

6. (Currently Amended) The method of claim [[1]] 3 further including the step of:

determining a memory leakage rate as a function of time when the countable increases in the peak allocated memory levels has increased said determined number of times that occur during a determined time interval reach the alarm limit.

7. (Original) The method of claim 6 further including the step of:

producing a response when the leakage rate exceeds a preselected determined level.

8. (Currently Amended) The method of claim [[1]] 7 further including the step of:

selecting the response from one of an action and a notification.

9. (Original) The method of claim 8 wherein the selected response is an action, said method further comprising the step of:

selecting the action from the group comprising no action, running a program or script, killing the program, rebooting the computer on which the program is executing and a combination of any of the foregoing actions.

10. (Original) The method of claim 8 wherein the selected response is a notification, said method further comprising the step of:

selecting the notification from the group comprising an e-mail message, a simple network monitoring protocol (SNMP) message, a telecommunications page, a visual notification on a management console or on the computer on which the program is executing, an audio notification on a management console or on the computer on which the program is executing, and a combination of any of the foregoing notifications.

11. (Original) The method of claim 7 further including the step of:

recording the response.

12. (Original) The method of claim 6 further including the step of:

generating an alarm signal when the leakage rate exceeds a ~~preselected~~ determined level.

13-15. (Cancelled)

16. (Currently Amended) A method of detecting memory leaks for a monitored application program stored in a memory of and executing on a computer, said method comprising the steps of:

(A) monitoring allocated memory levels at predetermined sampling times for the application program and for which a memory leak has not been detected; ~~and~~

(B) identifying increases in the peaks of the monitored allocated memory levels that are countable towards the alarm limit based on whether the ~~filtering-out~~ increases in peak allocated memory levels ~~not~~ are indicative of a memory leak associated with said program;

(~~BC~~) determining a memory leakage rate as a function of time when [[a]] countable increases in peak allocated memory levels ~~has increased a determined number of times~~ that occur during a determined time interval reach the alarm limit;

(~~CD~~) producing an alarm response when the determined leakage rate exceeds a ~~preselected~~ determined level.

17. (Cancelled)

18. (Currently Amended) The method of claim 16 wherein said steps (A) through (~~CD~~) are performed sequentially.

19. (Original) The method of claim 16 wherein said program is a first program, said method being performed by a second program executing on the computer on which the first program is executing.

20. (Original) The method of claim 19 wherein said computer is a first computer, said second program is executed in part on a second computer different from said first computer.

21. (Original) The method of claim 20 wherein said first and second computers are coupled to each other by a network.

22. (Original) The method of claim 19 further including the steps of:

selecting at least one operating parameter from the group including said determined number of times of peak allocated memory level increases, said determined time interval, said preselected level of said memory leakage rate, a sampling rate at which said monitoring step is performed, a startup time interval in which increases in peak allocated memory levels are filtered out, a time delay between increases in the peak allocated memory levels for which such increases are ignored as to said determined number of times the peak allocated memory level has increased, and said response; and

providing an interface for said second computer program that allows a user to specify a value for said at least one operating parameter.

23. (Original) The method of claim 22 wherein said providing step includes the substep of:

configuring said interface so as to allow a user to specify a plurality of values for a corresponding plurality of said operating parameters.

24. (Original) The method of claim 20 further including the steps of:

selecting at least one operating parameter from the group including said determined number of times of peak allocated memory level increases, said determined time interval, said preselected level of said memory leakage rate, a sampling rate at which said monitoring step is performed, a startup time interval in which increases in peak allocated memory levels are filtered out, a time delay between increases in the peak allocated memory levels for which such increases are ignored as to said determined number of times the peak allocated memory level has increased, and said response; and

providing an interface for said second computer program that allows a user to specify a value for said at least one operating parameter.

25. (Original) The method of claim 24 wherein said providing step includes the substep of:

configuring said interface so as to allow a user to specify a plurality of values for a corresponding plurality of said operating parameters.

26. (Currently Amended) An apparatus for detecting memory leaks for ~~[[a]]~~ an application program executing on a computer, said apparatus comprising:

means for monitoring allocated memory levels at predetermined sampling times for the application program and for which a memory leak has not been detected; ~~and~~

means for identifying increases in the peaks of the monitored allocated memory levels that are countable towards the alarm limit based on whether the ~~filtering out~~ increases in peak allocated memory levels ~~not~~ are indicative of a memory leak associated with said program;

means for producing a response when ~~[[a]] countable increases in peak allocated memory levels~~ has increased a determined number of times that occur during the determined time interval reach the alarm limit.

27. (Cancelled)

28. (Currently Amended) The apparatus of claim 26 ~~wherein said monitoring and filtering means includes further including:~~

means for defining a startup time interval that begins with the initial execution of said application program on the computer and which has a preselected duration;

means for ignoring increases in peak allocated memory levels that occur during [[a]] said startup time interval immediately after said program begins to execute such that any increase in peak allocated memory levels that occur during the startup time interval are not countable towards said alarm limit.

29. (Currently Amended) The apparatus of claim 26 ~~wherein said monitoring and filtering means further includes further including:~~

means for establishing a preselected time corresponding to a minimum time between a first increase and a second, subsequent increases in peak allocated memory levels in order for said second increase in peak allocated memory to count towards said alarm limit;

means for ignoring as not countable towards said alarm limit the second increase[[s]] in peak allocated memory levels when said second increase that occurs less than [[a]] the preselected time apart after said first increase, which may be indicative of normal memory allocation activity.

30. (Currently Amended) The apparatus of claim 26 further including means for determining a memory leakage rate as a function of time when the countable increases in peak allocated memory levels ~~has increased said determined number of times~~ that occur during the determined time interval reach the alarm limit.

31. (Original) The apparatus of claim 30 further including means for producing a response when the leakage rate exceeds a preselected level.

32. (Original) The apparatus of claim 31 further including means for selecting the response from a plurality of actions, a plurality of notifications or a combination of said pluralities of both actions and notifications.

33. (Original) The apparatus of claim 32 wherein the selected response is an action, said apparatus further comprises means for selecting the action from the group comprising no action, running a program or script, killing the program, rebooting the computer on which the program is executing and a combination of any of the foregoing actions.

34. (Original) The apparatus of claim 32 wherein the selected response is a notification, said apparatus further comprises means for selecting the notification from the group comprising an e-mail message, a simple network monitoring program (SNMP) message, a telecommunications page, a visual notification on a display associated with the computer on which the program is executing, an audio notification originating with the computer on which the program is executing, and a combination of any of the foregoing notifications.

35. (Original) The apparatus of claim 31 further including means for recording the response.

36. (Original) The apparatus of claim 30 further including means generating an alarm signal when the leakage rate exceeds a preselected level.

37. (New) The method of claim 4 further including the steps of:

establishing a determined time corresponding to a minimum time between a first increase and a second, subsequent increase in peak allocated memory levels in order for the second increase in peak allocated memory level to count towards the alarm limit;

after the startup time interval, ignoring as not countable toward the alarm limit the second increase in peak allocated memory levels when the second increase occurs less than the determined time after the first increase, which may be indicative of normal memory allocation activity.